REMARKS/ARGUMENTS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Applicants acknowledge with appreciation the courtesy of an interview granted to Applicants' representative on February 21, 2007. During the interview, clarifying changes to claims 4 and 12 were discussed. Further, the "center portion" feature of independent claims 4, 12, and 14 was discussed. In view of the examiner's concern that the intensity of light passed through the incoming diffraction grating is a function of both the grating and the light source, those claims have been amended to clarify that the incoming-side (e.g., the first diffraction grating in claim 14) diffraction grating is configured relative to the light source such that only a center portion of the light from the outside, having a stronger intensity than a peripheral portion of the light from the outside, is passed though the first diffraction grating. These amendments are also believed to address the enablement issues broadly raised in the office action.

Claims 4-7 and 12-15 are presently active in this case. The present Amendment amends independent Claims 4, 12, and 14 without introducing any new matter or raising new issues. Applicants note in particular that claims 4 and 12 have been amended to clarify that a grating pitch of the incoming-side diffraction grating is substantially equal to a grating pitch of the *second* outgoing-side diffraction grating. Prior to this amendment, claims 4 and 12 defined that the grating pitch of the incoming-side diffraction grating was substantially equal to a grating pitch of the *first* outgoing-side diffraction grating. As pointed out during the interview, non-limiting support for this change can be found in "Example 1" and Figure 1 of the Specification which teach that the grating pitch (1.15 μm) of the reflective diffraction grating 105 (i.e., the second outgoing-side diffraction grating) is equal to the grating pitch (1.15 μm) of the incoming-side diffraction grating 102.

The outstanding Office Action objected to Claims 4, 12, and 14 for introducing new matter; Claims 4-7 and 12-15 were rejected under 35 U.S.C 112, first paragraph, for failing the written description requirement; Claims 4-7 and 12-15 were rejected under 35 U.S.C 112, first paragraph, for failing the enablement requirement; Claims 4-7 and 12-14 were objected to; Claims 4-6, 12, 14, and 15 were rejected under 35 U.S.C. §103(a) as unpatentable over Nakanishi et al. (U.S. Patent No. 6,728,034, herein "Nakanishi") in view of Morton et al. (U.S. Patent No. 5,999,318, herein "Morton"). Claims 7 and 13 were rejected under 35 U.S.C. §103(a) as unpatentable over Nakanishi and Morton in view of Chen et al. (U.S. Patent No. 5,914,811, herein "Chen").

In response to the new matter objection and the 35 USC 112, first paragraph, rejection of claims 4-7 and 12-15, Applicants have amended independent claims 4, 12, and 14 by deleting the "width" limitation. Applicants respectfully submit that the specification teaches by way of non-limiting examples at Page 15, lines 14-27 and page 36, line 20 – page 37, line 13, respectively, (a) that "[t]he incoming-side diffraction grating 302 may be formed in substantially the entire region excluding a peripheral region where the intensity of the light flux of the incoming light 303 is weak, or it may be formed only a part of such region" and (b) that "*only* the center portion of the light which had a stronger intensity at the incoming-side surface of the diffraction element was passed through the incoming-side diffraction grating 102, and the other part of light was diffracted. The center portion of the light without being diffracted and light propagating through the region other than the incoming side diffraction grating 102 and propagating rectilinearly, were respectively diffracted and separated into three directions at the three-beam generating diffraction grating to be introduced into an optical disk by means of a collimator lens or an objective lens (not shown)." Italics added for emphasis. Hence, Applicants respectively submit that the specification supports the claim 4 limitation "wherein the incoming-side diffraction grating is

configured relative to the light source such that only a center portion of the external light, having a stronger intensity than a peripheral portion of the external light, is passed through the incoming side diffraction grating." Claims 12 and 14 are believed to find support in the specification for the same reasons.

In response to the objection to claims 4, 12, and 14 for reciting "stronger intensity," Applicants point out that the Specification teaches at page 15, lines 23-27 that "[t]he intensity of the actual diffraction light is determined based on the diffraction efficiency of the diffraction grating and the surface area of the diffraction grating with respect to the cross-sectional area of the light flux." Further, Applicants point out that claims 4, 12, and 14 compare the intensity of a center portion of the external light with the intensity of a peripheral portion of the external light. Hence, Applicants submit that the recitation "stronger intensity" is not confusing or indefinite.

In response to the objection to claims 4 and 12, Applicants have amended those claims to address the antecedent basis issue identified in the office action.

In response to the objection to Claim 7, Applicants respectfully traverse the rejection, since Claim 7 depends from Claim 5, and not from Claim 6. Therefore, there are no outstanding issues of antecedent basis regarding the expression "a saw-tooth shape." Accordingly, Applicants respectfully request reconsideration of the objection to Claim 7.

In light of the amendments to independent Claim 4, Applicants respectfully request reconsideration of the rejections of Claims 4-7 under 35 U.S.C. §103(a), and traverse the rejections, as discussed next.

Briefly recapitulating, Applicants' Claim 4 (as amended) relates to a diffraction element and includes, *inter alia*: a substrate with an incoming-side surface opposite to an outgoing-side surface, the incoming-side surface configured to receive light from a light source external to the substrate; an incoming-side diffraction grating having a grating pitch; a

first outgoing-side diffraction grating, a second outgoing-side diffraction grating having a grating pitch, covered by a reflective layer, and having a concave/convex shape in cross-section. The second outgoing-side diffraction grating is positioned on a light path of a light diffracted by the incoming-side diffraction grating, wherein *the incoming-side diffraction grating* is configured relative to the light source such that ***only a center portion of the external light***, having a stronger intensity than a peripheral portion of the external light, *is passed though the first incoming side diffraction grating*. Further, the grating pitch of the incoming-side diffraction grating is substantially equal to a grating pitch of the second outgoing-side diffraction grating.

As a consequence of the incoming-side diffraction grating configuration, the external light is incident only onto the portion having the diffraction grating of the incoming-side surface. Further, as explained in Applicants' Specification at page 14, lines 10-14 with corresponding Figure 1, Applicants' invention improves upon conventional diffraction elements because it can reduce the effects related to changes in propagation direction of the diffracted light when the wavelength of the diffracted light is not constant.

In a non-limiting embodiment explained in Applicants' specification in accordance with the illustration of Figure 1 (and Example 1), a center portion of the external light is passed through the first incoming side diffraction grating, about 85% of the light emitted from the semiconductor laser 107 will reach the grating 103, while 5% of the light will be detected by the receptor 108 via the grating 102 and the reflective diffraction grating 105.

Turning now to the applied references, Nakanishi describes a diffractive optical element, however Nakanishi fails to teach or suggest that the incoming-side diffraction grating is configured relative to an external light source such that only a center portion of the external light is passed though the first incoming side diffraction grating. In all the embodiments of Nakanishi, the external light exclusively enters through the diffractive

optical element pattern 4. Nakanishi clearly explains that "second diffractive optical element patterns 9 and 10 are positioned so as to be either directly incident to diffracted light that is produced by the first diffractive optical element pattern 4 or incident to the diffracted light after it has been subjected to total internal reflection by the main surfaces two times."[1] In all Nakanishi's Figures 1-2, 6, 7A-7B, 8, 9A-9B, 10, and 12A, it can be seen that the incoming light is focused on the diffractive optical element pattern 4, since Nakanishi teachings are designed for "polarizing beam splitting," wherein the entire incident light is polarized.[2] Accordingly, Nakanishi fails to teach or suggest that the incoming-side diffraction grating is configured relative to the light source such that only a center portion of the external light is passed though the first incoming side diffraction grating, as recited in Applicants' Claim 4.

The office action asserts that "one skilled in the art, would understand that a diffraction grating having a *definite* width will allow different portion of an external beam to pass through the diffraction grating, **depending** on the beam waist of the incident external beam." Emphasis in the original. In response, Applicants reiterate that, if Nakanishi's diffractive optical element pattern 4 was configured so that the incident light Lo would not entirely pass therethrough, Nakanishi's diffractive optical element would only polarize a small part of the incident light. However, Nakanishi is interested in splitting the entire beam into polarized light. There is no evidence that a person of ordinary skill in the art would have been motivated to implement such changes and redesign.[3]

The secondary references Chen and Morton do not remedy the deficiencies of Nakanishi. Chen is concerned with polarizing beam splitters. Accordingly, Chen is also silent on the incoming-side diffraction grating being configured relative to a light source such

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[1] See Nakanishi at column 10, lines 44-48.
[2] See Nakanishi at column 3, lines 1-3.
[3] See In re Ratti, 270 F.2d 810, 813, 123 USPQ 349, 352 (reversing an obviousness rejection where the "suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate.")

that only a center portion of the external light is passed though the first incoming side diffraction grating, as recited in Applicants' Claim 4. Morton describes an extra manufacturing step to cover a diffraction grating with a reflective layer made of aluminum.[4] However, Morton is also silent on any particular arrangement of diffraction gratings, and fails to teach or suggest the incoming-side diffraction grating is configured relative to a light source such that only a center portion of the external light is passed though the first incoming side diffraction grating, as recited in amended Claim 4.

Therefore, even assuming *arguendo* that the combination of Nakanishi, Chen and/or Morton is assumed to be proper, the combination fails to teach every element of the claimed invention. Specifically, the combination fails to teach or suggest (a) that the incoming-side diffraction grating is configured relative to a light source such that only a center portion of the external light is passed though the first incoming side diffraction grating or (b) that a grating pitch of the incoming-side diffraction grating is substantially equal to a grating pitch of the *second* outgoing-side diffraction grating, as recited in Applicants' Claim 4. Accordingly, for at least the above stated reasons, Applicants respectfully traverse, and request reconsideration of, this rejection based on these patents.[5]

Independent Claims 12 and 14 recite limitations analogous to the limitations recited in independent Claim 4. Accordingly, for the reasons stated above for the patentability of Claim 4, Applicants respectfully submit that the rejections of Claims 12, and 14, and all associated dependent claims, are also believed to be overcome in view of the arguments regarding independent Claim 4.

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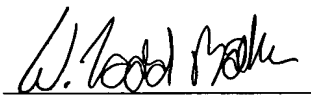
[4] See Morton in the Abstract, and at column 4, lines 6-11.
[5] See MPEP 2142 stating, as one of the three "basic criteria [that] must be met" in order to establish a *prima facie* case of obviousness, that "the prior art reference (or references when combined) must teach or suggest all the claim limitations," (emphasis added). See also MPEP 2143.03: "All words in a claim must be considered in judging the patentability of that claim against the prior art."

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal Allowance. A Notice of Allowance for Claims 4-7 and 12-15 is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact Applicants' undersigned representative at the below listed telephone number.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Gregory J. Maier
Attorney of Record
Registration No. 25,599

W. Todd Baker
Registration No. 45,265

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 06/04)